Comparison between the effects of seismic anisotropy and dipping layer on P-wave receiver functions

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In order to study the effect of seismic anisotropy and dipping layer on Ps converted waveforms, we calculated synthetic P-wave receiver functions (PRF) of radial and transverse components for a two-layered anisotropic model which consists of an anisotropic surface layer and an isotropic bottom layer and a two-layered isotropic model which consists of a dipping surface layer and a bottom layer. The synthetic PRF was ray-theoretically calculated for the velocity models. The transverse component of PRF shows that the Ps waveform periodically varies versus ray back azimuth and the waveform variation for the anisotropic model is very similar to that for the dipping layer model. This means that the Ps waveform variation versus back azimuth is not available to distinguish the effect of the seismic anisotropy from that of the dipping layer. We examined particle motion diagram of the radial and transverse components of the Ps phases for the two-layered anisotropic model and the dipping isotropic layer model. The Ps phase shows a linear particle motion for the dipping layer model, whereas it exhibits a closed-curve particle motion for the anisotropic layer model. Thus we can see difference in the effect of the seismic anisotropy and the dipping layer by using the particle motion of Ps converted waves.